queathed to him by former astronomers. One of these was the great Paris catalogue of stars, depending upon meridian observations made within the period 1837–1881, including the re-observation of all Lalande's stars. The complete work, published in four sections, furnishes the places of nearly 35,000 stars, based upon 387,000 single measures. This heavy piece of work was brought to a very satisfactory conclusion under the supervision of M. Loewy, and by its completion the observatory staff is relieved of an oppressive incubus. The other is the International Star Chart, which had its origin under Admiral Mouchez. Not only has this work been prosecuted with ardour at the observatory, but encouragement and assistance were given to all who participated in the scheme, by means of conferences that have been held from time to time in the observatory at the suggestion of the regretted director. To both these projects M. Loewy gave as generous and consistent support as though he were responsible for their introduction.

M. Loewy's more immediate influence on the conduct of the observatory is shown in the steady prosecution of another piece of work, the chart of the moon derived from photographs taken with the equatorial coudé, a form of telescopic mounting with which M. Loewy's name is closely connected. The long focal length, which is one of the advantages secured in this class of telescope, giving an image of the moon more than seven inches in diameter, made this instrument peculiarly suitable for the investigation. The admirable reproductions made from the negatives justify the time and attention that have been bestowed on the enlargements. Concurrently with the issue of the maps there have been published acute dissertations on the physical constitution of the moon, founded on a minute critical study of the lunar surface. This close and detailed examination led the director to conclude that there were evidences of a permanent elongation of the moon's figure towards the earth, and of a surface action tending to diminish the angular velocity of rotation.

But besides the study of the moon's surface, the equatorial coudé has served another purpose. The principle of construction is so well known that it is not necessary to describe it here. But in designing this instrument M. Loewy had in view the possibility of obtaining greater stability than is attainable with ordinary equatorials, and by taking advantage of this stability to measure large angular distances on the celestial sphere. Having determined, by a thorough examination of the theory, the sources of error inherent in the instrument, M. Loewy proceeded to use it for obtaining a new value of the constant of aberration by an entirely novel method. For this purpose he placed a double mirror, formed by silvering two faces of a large prism of glass, in front of the object glass. The double mirror was capable of rotation about the axes of the telescope, so that by reflection from the two silver surfaces the images of two stars in different parts of the sky could be brought into the field side by side, and the distance between them measured in the common plane of reflection. By choosing suitable stars and making the necessary measures six months apart, the quantity measured could be made four times that of the constant of aberration. For greater accuracy the stars selected had the same altitude so as to reduce the effects of refraction to a minimum, but by changing the plan of observation it was possible to investigate the effects of refraction separately. The instrument lent itself to methods of great beauty and ingenuity, displaying both the mechanical ability of the inventor and the varied resources of the mathematician and astronomer. The Royal Astronomical Society fittingly acknowledged its appreciation of the important services M. Loewy had rendered to astronomy by awarding him the gold medal. Needless to say, he was an honorary member of that society as of many others, both in his own country and abroad.

It would not be possible, even if it were desirable, to record all the varied occupations in which M. Loewy was engaged in the course of his scientific career. His position made him frequently the adviser of his Government in many important matters. His services to the Bureau des Longitudes, in his capacity of director of the Connaissance des Temps, will be readily acknowledged. The part he played in various conferences, such as those which arranged the scheme for observing the planet Eros and for securing uniformity in the employment of astronomical constants, has been already mentioned. We can only deplore, in company with the whole guild of science throughout the world, the loss of one who ornamented a dignified position and worthily supported the traditions of the National Observatory. Within the last few years the continuity of its direction has been too frequently interrupted by the loss of its distinguished chiefs. Among these brilliant memories the name of Maurice Loewy will hold an honoured place. Round his grave in respectful sympathy were grouped the representatives of many learned societies. In addition to those of France, there were present members of the Academy of Sciences of Vienna, of the R. Accademia dei Lincei, while the Royal Society of London, as well as the Royal Astronomical Society and the British Association, were represented by Sir David Gill and Major MacMahon.

NOTES.

It is reported that at Monday's meeting of the Paris Academy of Sciences Prof. Lapparent described some experiments by Prof. Bordas upon the conversion of corundum into precious stones by the influence of radium. It is stated that when fragments of corundum were placed in contact with a tube containing radium for a month they changed colour entirely, and were transformed into crystalline varieties of the mineral, some pieces becoming yellow, like topaz; others purple, like amethyst; blue, as sapphire; and red, as rubies. The gems thus produced were submitted to a jeweller, who was unable to distinguish them from precious stones. We shall await with interest the appearance of the *Comptes rendus* of Monday's meeting for particulars of these experiments and results.

The death is announced of Prof. Gustav Adolf Zeuner, the distinguished authority on applied mechanics. Born at Chemnitz in 1828, he was the founder, and editor from 1853 to 1857, of the German journal the *Zivilingenieur*. In 1855 he was appointed professor at the Zurich Polytechnic, of which institution he was director from 1865 to 1868. From 1871 to 1875 he was director of the Freiberg School of Mines, and from 1873 to 1890 he was also director of the Dresden Polytechnic. He retired in 1895. His works included treatises on valve gearing and on the mechanical theory of heat.

Dr. Elis Strömgren, private tutor at the Kiel University, has been appointed professor and director of the Copenhagen Observatory in succession to Prof. T. N. Thiele, retired.

Sir Herbert Maxwell has been appointed chairman of the council of the National Association for the Prevention of Consumption in succession to the late Sir William Broadbent, and Dr. C. Theodore Williams has been elected vice-chairman.

The cup for the winner of the International Balloon Race, to be awarded to the aëronaut landing furthest from St. Louis in a measured straight line, has been won by Herr Erbsloh (Germany), who descended at Annapolis Junction, Maryland, having covered a distance of 874·4 miles.

The death is announced of Mr. T. F. Brown, a recognised authority on the geology of the South Wales coalfield. Mr. Forster Brown was a member of the Institute of Civil Engineers, a Fellow of the Geological Society and of the Surveyors' Institute, and past-president of the South Wales Institute of Engineers.

We are asked to announce that the annual "fungus foray" of the Essex Field Club will take place on Saturday, November 2, at Loughton and Theydon Bois, Epping Forest. The director will be Mr. George Massee, of the Kew Museum. Botanists wishing to be present should communicate with the secretary, Mr. W. Cole, Buckhurst Hill, Essex.

Referring to his letter in Nature (October 3, p. 568), the Rev. Dr. Irving writes to state that his assignment to the Upper Eocene or Oligocene of the fossiliferous limestone discovered in a well-sinking at Thorley, near Bishop's Stortford, was erroneous. The bed in question is probably Lower Eocene, of the age of the Oldhaven beds.

Count G. N. Plunkett, who has just taken office as director of the Dublin Museum of Science and Art, initiated the system of museum "demonstrations" about ten years ago, and has lectured on the arts and artistic crafts, and also on Irish archæology. In the Cork Exhibition of 1903 he organised a nature-study section, the work of more than a hundred schools. He is known outside Ireland through his book on Sandro Botticelli.

The list of lectures to be delivered at the London Institution during the present winter session is varied and comprehensive. Prof. G. S. Boulger takes for his subject the Andes of Peru; Prof. W. M. Flinders Petrie, F.R.S., will describe ancient Egyptian houses; Mr. E. S. Bruce is to explain the coming of the aëroplane, with the aid of experiments and illustrations; Mr. A. R. Hinks will discuss the evidence for life on Mars; Mr. I. S. Scarf takes up the subject of flames; Mr. L. E. Hill, F.R.S., researches on deep-sea diving; Prof. W. B. Bottomley, soil inoculations; and Mr. P. Chalmers Mitchell, F.R.S., ruminating animals. The lectures for juveniles will be delivered during the Christmas vacation by Prof. Grenville A. J. Cole, his subject being three days of open-air geology.

Calabria was subjected to a severe earthquake shock during the evening of October 23. The disturbance, which occurred at 8.30 p.m., seems to have followed the same line and to have been felt throughout the same districts as that of 1905. The centre of the disturbance was located in Monteleone, and its effects seem to have been noticed from Catanzaro to Reggio di Calabria. Reports of varying amounts of damage have been received from Gerace, Sinopoli, Pizzo, Tropea, and other places, which also suffered two years ago. Secondary shocks were felt on October 24, but from observations which have been recorded it is believed that the earthquake of last week was less severe than that of 1905. The shocks on both days were recorded by Prof. Milne's instruments at Shide, in the Isle of Wight, and by Prof. Belar at Laibach, in Austria. The number of victims is variously estimated, Reuter putting the number at 600. The damage is extensive and widespread. Shortly before 6 p.m. on October 28 a violent shock was experienced at Monteleone, Santa Eufemia, Bagnara, and Sinopoli.

Mr. Balfour on October 25 opened the new administrative buildings and two new wards at the Royal Victoria Hospital for Consumptives at Craigleith, Edinburgh. During the course of an address, Mr. Balfour said it is impossible to withhold wonder at the enormous strides which scientific medicine has made in the treatment of consumption in less than thirty years. Referring to future work in this direction, he remarked:—"If we cannot destroy and expel the tubercle bacillus from among us, we can reduce its power to do evil to a degree which may seem to us at the moment to be almost incalculable. We have an example before us of what has been done with regard to typhus. I doubt whether there is a single case of typhus in Edinburgh at this moment; and it may be that our children will live to see the time when consumption will be as little known in their midst as typhus is at this time. We have made the conditions of infection with regard to typhus so small that the power of resistance of the community at large is amply adequate to prevent its making any lodgment of a serious kind in our midst. That is the ideal to which we look forward with regard to tuberculosis." Continuing, Mr. Balfour pointed out that it is a great responsibility resting upon every person to see that the doctrines of modern scientific medicine penetrate, not merely among the well-to-do, but to every class in the community.

According to *Museum News* for October, a figure of a native Australian, carefully modelled by an eminent Washington sculptor, has been placed in the Brooklyn Museum alongside stuffed specimens of the man-like apes, in order to illustrate the wide differences between the latter and the lower races of mankind. Silk-worm-culture and silk-manufacture are now illustrated in the museum by cases of living silk-worms, as well as by exhibits of the more important descriptions of raw silk.

Total prohibition of the use of the plumage of wild birds as articles of dress is regarded by Prof. T. H. Montgomery (Bull. Univ. Texas, No. 79) as the only effectual remedy against what he regards as a mischievous fashion. "It will not do," he writes, "to prevent the killing of our American birds and to allow the importation of foreign ones, for this would be injuring another country, and in the long run, for the sake of greater cheapness, would result in the killing of our native species."

The additions to the Zoological Society's menagerie during September were 149 in number, of which sixty-eight were acquired by presentation and two by purchase, while sixty-five were received on deposit, four by exchange, and ten were born in the gardens. Amongst these, special attention is directed by the secretary to the following, viz. a female giraffe, born on September 20; a male gayal, born on September 6; three harnessed antelopes (*Tragelaphus scriptus*); a nagor antelope (*Cervicapra redunca*); and two side-striped jackals (*Canis lateralis*), from Gambia, presented by Sir George Denton; and a Cayenne kite-falcon (*Leptodon cayennensis*), deposited.

Vol. lxxxviii., part i., of *Zeitschrift für wissenschaftliche Zoologie* contains an exhaustive article on the morphology and life-history of the vine Phylloxera (*Phylloxera vastatrix*), by Mr. H. Stauffacher, of Frauenfeld, Switzerland, illustrated by a coloured plate showing the chief developmental stages and the dimorphic phases of the winged adults. At the conclusion of the article special attention is directed to the origin of these dimorphic phases, which include a larger and a smaller form; diagrammatic illustrations being given of the various theories proposed. According to the author's view, trimorphic nymphs are developed, from which are produced what he terms the α form, β form, and γ form, which in turn respectively give rise to the parthenogenetic generation, to males, and to females.

To the July issue of the Proceedings of the Philadelphia Academy, Mr. E. G. Conklin contributes a paper on the embryology of the gastropod Fulgur, from the point of view of the influence of the yolk on development. The eggs of this genus are remarkable for their large size, the bulk being almost wholly due to the quantity of yolk; and one of the problems to which special attention was devoted is the effect of large or small yolks on the development of the organs of the embryo. For the author's conclusions our readers must be referred to the original paper; but it may be mentioned that after a certain stage the elements of the Fulgur yoke cleave irregularly, a feature which may foreshadow the "meroblastic" eggs of birds and reptiles, in which only a portion of the yolk undergoes cleavage.

WE have received copies of a circular issued by the Vigilance Committee of the Fur and Skin Trade Section of the London Chamber of Commerce directed against the alleged practice of certain retailers in wrongly marking, naming, and advertising furs for sale, in violation of the Act of Parliament against "false trade descriptions." The action taken by the committee has already led to satisfactory results, but there appears reason to believe that the illegal practice still continues. Among the scheduled items are musquash and nutria (coypu) fur, sold, "when pulled and dyed," as seal; and nutria, when "pulled natural," sold as beaver. Dyed rabbit fur sold as sable, white rabbit as ermine, and dyed white rabbit as chinchilla, also appear in the list. It is added that purchasers who may have any doubt as to whether furs sold to them are correctly described can obtain expert opinion, free of charge, by forwarding the articles to the offices of the London Chamber of Commerce, Oxford Court, Fleet Street, E.C.

IN the introduction to his report on the diatoms collected in the Pacific Ocean on the voyages during the years 1898 to 1904 of the steamer *Albatross*, belonging to the United States Bureau of Fisheries, Dr. A. Mann claims that, as owing to their minuteness diatoms can be transported by slow currents or surface drifts, a tabulation of the species found at different stations would provide useful data for determining the direction and extent of ocean currents. He also quotes several instances to show how different species are confined to, and therefore typical of, distinct localities. The systematic enumeration contains a careful digest and sifting of previous nomenclature. The genera Navicula, Biddulphia, and Coscinodiscus are richest in species, and also provide the larger number of new species. The report is published as vol. x., part v., of the Contributions from the United States National Herbarium.

WE have received the annual report of the medical officer of health (Dr. Seaton) of the administrative county of Surrey for 1906. The prevalence of enteric or typhoid fever in the administrative county is the subject of a special report. The incidence of 2093 cases occurring during the last twelve years has been reviewed, and the opinion is expressed that it is doubtful whether even 10 per cent. of the cases can be attributed to the drinking of a polluted or infected water supply, and there seems to be no evident relation between the rainfall, and consequent floods, to typhoid prevalence. Dr. Seaton believes that polluted and infected foods are a much more frequent source of typhoid illness than is even now generally supposed. He also refers to the occurrence of cases which it is impossible to connect with any other case, and suggests the possibility of new origin (*i.e.* apart from human infections) through bacilli other than those which are regarded as the invariable specific causes of typhoid. With regard to this, it may be mentioned that recent German researches have shown that patients may harbour the typhoid bacillus for months after they have recovered from an attack, and that even well persons may occasionally be the hosts of the organism; it seems hardly necessary, therefore, to suggest a *de novo* origin.

UNDER the title of "The Tuna as a Food for Man," Mr. R. F. Hare and Mr. D. Griffith have provided in Bulletin No. 64 of the Agricultural College, New Mexico, an illustrated account of the varieties of fruit—commonly called prickly pear—grown to a considerable extent in Mexico. The fruits described are species of Opuntia; they have a thin skin more or less covered with spicules, under which is a rind enclosing the pulp and embedded seeds. The pulp alone is generally eaten, but sometimes part of the rind is included. The fruit is relished by the peons and poorer classes, and is harvested for shipment. There is also a local manufacture of products of the nature of honey, sugar-paste, and toffee.

THE Quarterly Journal of the Liverpool Institute of Commercial Research in the Tropics, vol. ii., No. 5, contains excellent illustrations of some African fibrous plants from photographs by Mr. J. A. Alexander, formerly of Portuguese East Africa. Dr. E. Drabble furnishes notes on the synonymy, morphology, and fibres of leaves of *Sansevieria guineensis* and *Agave rigida*, also on the seeds of *Myristica angolensis* and fruits of *Lophira alata*. From the latter the natives of West Africa obtain a cooking oil, and the fat of Myristica is suitable for soap-making. Dr. D. Spence contributes articles on the analyses of latex and rubbers, the most important being a discussion of the methods of analysing raw rubbers.

A SECOND hundred of the leaflets published by the Board of Agriculture for free distribution has been completed. They deal with farm and garden crops, insects and fungal pests, and the breeding and management of farm animals. Among recent issues are two containing information on the winter rot of potatoes caused by the fungus *Nectria solani*, and the black rot of cabbage attributed to the bacterium *Pseudomonas campestris*. The Nectria appears on stored potatoes, forming white, and later pink, patches, from which arise crops of spores that spread the disease and reduce the tubers to a fœtid mass. The ascospores developed in the following season can infect growing crops. The cabbage rot is readily distinguished by the black appearance of the vascular bundles along which the bacteria travel. The Sycamore leaf-blotch, caused by species of Rhytisma, so familiar by reason of the black patches produced, is described in another leaflet. An account of the coltsfoot, *Tussilago farfara*, and a note on the Fertilisers and Feeding Stuffs Act, 1906, have also been published.

THE King has instituted a new medal for bravery in mines. The Royal Warrant states that the King is desirous of distinguishing by some mark of Royal favour the many heroic acts performed by miners and quarrymen who endanger their own lives in endeavouring to save the lives of others. The new medal will be of two classes, which are to be designated the Edward medal of the first class and the Edward medal of the second class. The ribbon will be dark blue with a narrow yellow stripe on either side.

THE *Engineering Magazine* for October is a special number of great interest, devoted exclusively to mining. There are articles on the copper situation in the United States, the production of gold, the mechanical engineering of the mine, the manufacture of steel and wrought iron, asbestos, excavations for the foundations of a modern tall building, electrometallurgical progress, steam production from the cheaper grades of anthracite, underground workings in New York City, and the unwatering of mines in the anthracite region. All these articles are written by leading authorities and are admirably illustrated, and the whole forms a trustworthy review of current practice.

AT the first meeting of the new session of the Institution of Mechanical Engineers, Prof. Bertram Hopkinson read an important paper on the indicated power and mechanical efficiency of the gas engine, describing an investigation made with the object of finding whether the indicator power of the gas engine does, in fact, vary so much and is so difficult of determination as the report of the committee of the Institution of Civil Engineers on the efficiency of internal-combustion engines suggests. The conclusions reached were as follows:—(1) If precautions are taken to keep the pressure of the gas supply constant, the diagrams given by the engine are remarkably regular, and whether the engine be missing ignitions or not, it is possible, by the use of a sufficiently accurate indicator, to obtain the indicated power from diagrams within 1 per cent. or 2 per cent. It seems probable that the difficulty experienced by the committee was due either to the essential defects, for this purpose, of the ordinary form of indicator, or to casual variations in the gas supply per suction due perhaps to variation in the gas pressure at the engine. (2) The difference between indicated horse-power and brake horse-power is rather less than the horse-power at no load under the same conditions of lubrication, mainly because of the difference in the power absorbed in pumping. In the particular engine tested by Prof. Hopkinson the error from this cause in obtaining the indicated power would amount to about 5 per cent. The friction is substantially constant from no load to full load, provided that the temperature of the cylinder walls is kept the same, but the influence of temperature is very great.

THE current number of the *Quarterly Review* includes an important article, by Mr. Urquhart A. Forbes, on the water supply of the United Kingdom. The importance of treating water supply on broad lines was pointed out by the 1869 Commission on Water Supply, when the adoption of the watershed area as the administrative unit for water supply was recommended. Since the water supply for purposes of navigation is derived from the various watersheds traversed by canals and river navigations, it is desirable that the authority in each watershed should be empowered to exercise some control over canal companies and river trustees with respect to the amount of water to be abstracted from it. Such watershed boards with the powers indicated would be able to carry out the scientific regulation of all water from its first arrival as rain to its disappearance in the ocean. It has been suggested that the staff of the central authority, which would be a department under the Local Government Board, would, in addition to the administrative head, comprise (1) an engineer and assistants, with a special knowledge of geology and water supply, charged with the duty of collecting and digesting for use all the facts requisite for the scientific treatment of our water system; (2) a bacteriologist and a chemist, with a special knowledge of the bacteriology and chemistry of sewage, trade effluents, and water supply, who should be provided with a laboratory for experiments; (3) a staff of inspectors for carrying out its supervisory work with respect to both pollution and waste of water. In addition to the facilities it would provide for the treatment of our water system on scientific principles, the establishment of a central water department offers the best means of restoring order in the present chaotic condition of things.

THE great changes wrought by the eruption of April, 1906, necessitated a re-survey of Mount Vesuvius, which has been effected by the Italian Military Geographical Institute. The extreme height of the mountain was determined as 1223 metres above sea-level, as compared with 1335 metres before the eruption; the height of the crater rim has become more irregular, dropping to only 1103 metres on the E.N.E., with a diameter of 725 metres from N.N.E. to S.S.W., and 645 metres from N.W. to S.E. At lower levels the contours have everywhere been enlarged from those of the survey in 1900, and in the Atrio del Cavallo and Valle dell'Inferno the depression has been filled up to the extent of from 5 metres to 50 metres.

IN travelling by rail, or still better by steamer, from Lyons to Avignon, a marked narrowing of the Rhone Valley is noticed after Valence, between the pre-Alps of Dauphiné on the left, and the singular dark ridge of Coirons on the right. This easterly spur of the central *massif* of France is capped by a thick sheet of basalt, which affords a striking instance of inversion of topography. There is no doubt that, at the close of the Miocene, when the molten rock issued from a vent located near Mount Gerbier des Joncs, it followed one of the channels of the river system of that period. Since that time the eastern border of the central *massif* (Cévennes) has been subjected to strong erosion, increased by the subsidence of the lower part of the Rhone Valley, and the consequent lowering of the base-level. The surrounding Cretaceous and Upper Jurassic limestones have been easily worn down and reduced to gentle slopes. The basaltic flow, about thirteen miles in length and three miles wide, resisted much more successfully the subaërial disintegration. In consequence of this very unequal weathering, what was once a valley is now a long ridge standing 2200 feet above the level of the Rhone. The history of the Coirons may be compared to that of the Scuir of Eigg in western Scotland. Unfortunately, a portion of the sheet of lava of Coirons rests upon the Oxfordian, easily undermined by the head-waters of the lateral torrents; the edges of the volcanic table are liable to break away and to creep down the slopes upon the clayey substratum. The landslip which occurred on October 11 above Moulin-Artige is only an episode in this process of slow undermining, which has reduced the formerly continuous basaltic plateau to the shape of a fish-bone. As a consequence of the torrential rains which occurred in southern France during the first part of October, nearly one million cubic metres of rocks has moved a distance of 900 metres, threatening to block a valley and to form a lake. Such incidents are bound to occur again on both sides of the Coirons, and the suggested re-afforesting of the district will tend to diminish, but not to prevent, all future danger. Perhaps it would be wise to restrict the construction of villages to safer ground.

MR. W. ERNEST COOKE, Government astronomer at the Perth Observatory, West Australia, directs our attention to an exhibition of globe lightning, or a fireball of some sort, which was noticed by two observers on September 7. Mr. Cooke did not himself see the display, but he can certify that about the time mentioned by the observers there was a blinding flash of lightning in the vicinity, followed almost immediately by a heavy crash of thunder. The observers who reported the matter to Mr. Cooke are stated by the *Daily News* of West Australia (September 9) to have described their experience as follows:—In the middle of the reverberation of the thunder a tremendous explosion about 6 feet from the ground was heard, and a momentary flash of blinding intensity was seen. Both saw a lurid red ball, estimated by them as about 4 inches in diameter with a circle of bright yellow flame, with a diameter which seemed to be 18 inches, which graduated in colour until it faded at the edges. As there are only a few authenticated instances of similar displays, it is desirable to place each new instance on record.

MESSRS. GEORGE PHILIP AND SON, LTD., have sent us a specimen of their "New Standard Time Dial" designed by Prof. R. A. Gregory for the determination of the local mean time at any place on the earth's surface, corresponding to the time at the place where the dial is being used. This simple and useful device consists of a stout wooden board on each side of which is printed a clock face showing the hours from noon to midnight and midnight to noon. Within each dial is a rotating disc on which is printed, on the one side, a map of the northern, and on the reverse side a map of the southern, hemisphere. Meridians of longitude are drawn at intervals of 15° on each map, and where a meridian marks a commonly used standard time, such as Greenwich, mid-Europe, or inter-Colonial, it is so designated; the meridian where the date changes from the American to the Asiatic date is also marked. By simply rotating the inner disc until the meridian of a place is opposite to the actual time, as shown on the dial, the corresponding local time at any other place may be read off directly. The device will be found serviceable, and its low price (3*s*. 6*d*. net) should ensure its appearance in all places, especially schools, where the longitude-time problem has to be solved frequently.

Le Radium for September contains an important article by M. Jean Becquerel on the influence of temperature on the absorption of solids. It appears from M. Becquerel's researches that increase of temperature of a solid displaces the absorption bands towards the red end of the spectrum by two or three units of the fifth figure of the wave-length per 100° C., while the bands at the same time increase in width and change in intensity, the width being proportional to the square root of the absolute temperature.

THE communication to the Physical Society of Berlin in which Dr. E. Goldstein announced his discovery of the existence of two independent spectra of each of the elements cæsium, rubidium, and potassium has been reproduced in full in the *Physikalische Zeitschrift* for October 15. The new spectra are produced by powerful condenser discharges, and have not a single line in common with the old, or as Dr. Goldstein names them, the arc spectra. The new lines do not appear to fall into series, and the author suggests that they constitute the "fundamental spectra" of these elements, the arc spectra being due to polymerisation in the metal vapour, which is impossible in the powerful sparks necessary to produce the former.

IN the June number of *Terrestrial Magnetism and Atmospheric Electricity*, Mr. Y. Homma calculates the rates of change of the electrical potential at different distances above the earth's surface on various assumptions as to the distribution of positive charges in the atmosphere, the earth being taken as a sphere. None of the calculated rates of change agrees with the somewhat meagre observations which have been made, and the author points out the importance of further work in this direction.

IN the report of the third Prehistoric Congress of France in NATURE of October 24 reference was made to some photographs of Japanese megaliths, which were said to have been taken by M. Goodhan (p. 649, col. 2, line 3), Prof. W. Gowland writes to say that the photographs were taken by him, and were lent to Mr. F. V. Dickins for exhibition at the conference. The name was printed exactly as it was given by the secretary of the conference, who furnished the report of which a translation appeared in NATURE.

OUR ASTRONOMICAL COLUMN.

ASTRONOMICAL OCCURRENCES IN NOVEMBER:—

Nov. 4. 15h. 33m. to 19h. 14m. Transit of Jupiter's Sat. III. (Ganymede).
10. Saturn's major axis outer ring = 43″·00, minor axis = 0″·64.
12. 4h. 11m. Moon in conjunction with Mars. (Mars 6° 58′ S.)
13. 22h. 23m. to } Transit of Mercury across the Sun.
14. 1h. 47m. }
,, 10h. 24m. Moon in conjunction with Saturn. (Saturn 2° 26′ N.)
14–16. Epoch of the Leonid meteors. (Radiant 150° + 22°.)
17. 10h. 1m. Minimum of Algol (β Persei).
20. 6h. 50m. Minimum of Algol (β Persei).
,, 4h. 25m. to 5h. 4m. Occultation of δ^1 Tauri (mag. 3·9).
,, 4h. 44m. to 5h. 35m. Occultation of δ^2 Tauri (mag. 4·7).
21. 17h. 6m. to 17h. 54m. Occultation of ζ Tauri (mag. 3·0).
23. 15h. 41m. to 17h. 1m. Occultation of δ Geminorum (mag. 3·6).
25. 20h. 34m. Moon in conjunction with Jupiter. (Jupiter 1° 57′ S.)
29–30. Mercury rises 2h. 2m. before the Sun.
30. 18h. 49m. to 23h. 39m. Transit of Jupiter's Sat. IV. (Callisto).

COMET MELLISH, 1907*e*.—Three observations of Mellish's new comet are reported in No. 4207 of the *Astronomische Nachrichten* (p. 111, October 17). Prof. Hartwig's observation on October 15 showed that the comet was round, with a diameter of 3′ and a central condensation. The magnitude at 15h. 52m. on October 15, as estimated by Prof. Becker at Strassburg, was 9·3.

THE TRANSIT OF MERCURY.—In view of the approaching transit of Mercury (November 14), Mr. W. T. Lynn publishes a letter in No. 388 of the *Observatory* (p. 382, October) in which he directs attention to earlier observations of this phenomenon and to its periodicity. He states that the first authentic observation of the transit was made in 1631 by Gassendi, and was followed by an observation by Jeremiah Shakerly, an Englishman who went to Surat, India, in 1651, for the purpose of observing the transit. Halley observed the 1677 transit at St. Helena, and this led him to suggest that transits of Venus would afford a peculiarly advantageous means of determining the solar parallax, a suggestion that was first carried out officially in 1761.

Mr. Lynn also directs attention to the peculiar commensurability existing between the orbital periods of the earth and Mercury, the former completing forty-six in